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DATE: May 5, 2004

TO: Examiner Lun-See Lao
U.S. Patent and Trademark Office
Group Art Unit: 2643

RE: **Appeal Brief**
U.S. Patent Application, S.N. 09/807,430
By: **Shuji KOIKE et al.**
Our Reference: P353-698-A010553

FROM: Nicholas S. Bromer

NUMBER OF PAGES (INCLUDING THIS COVER SHEET): **14**

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PLEASE ADVISE IF YOU NEED ANYTHING FURTHER.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Shoji Arikuma et al.	Confirmation Number: **7798**
Serial No.: **09/579,273**	Group Art Unit: **2643**
Filed: **May 26, 2000**	Examiner: **Lun-See Lao**
For: **AUDIO COMPONENT SYSTEM**	Attorney Docket: **000672**

APPEAL BRIEF

Commissioner for Patents, P.O. Box 1450
Alexandria, VA 22313-1450

Date: **February 22, 2004**

Sir:

A Notice of Appeal was filed in February 18, 2004. This Brief is in response to the Final Office Action mailed on December 1, 2003. In the event this paper is not timely filed, then this paper is a petition for an appropriate extension of time. The fees for such an extension or any other fees which may be due with respect to this paper may be charged to Deposit Account No. 01-2340.

REAL PARTY IN INTEREST

The real parties in interest are Sanyo Electric Co., Ltd., 5-5 Keihanhondori 2-chome, Moriguchi-shi, Osaka, Japan; and Sanyo Technosound Co., Ltd., 1-1 Sanyocho, Daito-shi, Osaka, Japan.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences..

STATUS OF CLAIMS

Claims 1-5 are pending, under consideration, rejected, and appealed.

STATUS OF AMENDMENTS

All amendments are entered.

SUMMARY OF INVENTION

The Appellants' claims relate to an audio system with interconnected components, such as a radio tuner, CD player, tape recorder, and the like, where the audio signal of one components is selected to be heard by the user (audio components 2-5 are shown in Fig. 1; see page 1, lines 4-9 of the specification).

To select just one of the audio components, the Appellants use a control circuit 15 (Fig. 1 and page 10, lines 10-13) which accepts selection commands from an input unit 14 and sends instructions to a selector means 17 (shown as a switch in Fig. 1; page 4, lines 13-15), which selects among the terminal inputs a, b, c, d on the housing of the amplifier 1 (the amplifier 1 is enclosed by a dashed line in Fig. 1). The selection is made by a user (page 17, line 14, original claim 1). The selected audio signal is amplified and processed through components 11, 12, and 13 (page 9, lines 17-20). This is recited in claim 1:

> *1. An audio component system comprising*
>
> *(a) a plurality of components for outputting audio signals,*
>
> *(b) a signal processing control unit connected to the components, the signal processing control unit comprising*
>
> *a plurality of signal input terminals for receiving audio signals from the components,*
>
> *selector means connected to the signal input terminals for selecting the audio signal received by a desired one of the signal input terminals,*
>
> *a signal processing circuit for processing the selected signal and outputting the resulting audio signal ...*

A control bus 7 (Fig. 1) interconnects the control circuit 15 and the several components.

The output signal can be muted by a muting circuit 16 (Fig. 1), before being output to the loudspeaker 6 (page 9, lines 20-25). The muting circuit 16 is activated by the control circuit 15, automatically, whenever the user selects a component which is not connected to the amplifier 1 at the terminals a-d (page 10, lines 18-22). The user pushes a selection button, not a muting button.

This feature overcomes a disadvantage of the prior art, which is explained at page 3, line 14 in relation to prior-art Fig. 6. In the prior art, which lacks the Appellants' muting circuit and control bus, the amplifier 9 cannot recognize which components are connected to the amplifier, and therefore if the user commands the control circuit 98 to select a component which is not connected or is not turned on, a loud noise from the loudspeaker 6 results.

The reason for this loud noise is that the amplifier 9 includes a feedback circuit in the loudness control, which provides constant loudness from signals of differing strength entering the amplifier 92 from the various components 20, 30, 40, 50. Such circuits are used in radios to prevent strong-radio-signal stations from sounding louder than weak-radio-signal stations; the honorable Board is referred to the attached pages from electronic textbooks which show that such circuits, called AGC for Automatic Gain Control, are conventional. When there is no signal from a selected component, either due to disconnection or because the component is not working, the input signal level is zero and the AgC circuit attempts to boost the zero signal to the regulated input signal level, which results in the noise.

The Appellants overcome this problem (page 4, lines 2-6), first by providing the mute circuit 16 shown in Fig. 1; second, by connecting the amplifier and components so that they can communicate with each other through the bus 7 (page 4, lines 21-24 and Fig. 1); and third, by using the amplifier control circuit 15 to activate the mute circuit 16 if the selected component is not connected or powered.

The Appellants describe the control circuit, the bus, and the muting means in the Summary portion of the specification (starting at page 4, line 18) and the Detailed Description explains in greater detail that the components 2, 3, 4, 5 each has a respective control circuit 22, 32, 42, 52 which is connected to the control circuit 15 of the amplifier 1 through the control bus

7, and the control circuit 15 mutes the sound when an "audio signal from the component which is not connected to the amplifier unit or unenergized is selected by the selector 17" (page 10, lines 18-22).

Flowchart Fig. 2 shows that the control circuit transmits a "call signal" to each component (page 11, line 11 to page 12, line 2). A flag is set for each component according to its state (page 12, line 20 to page 13, line 4), to keep a record of the component's status. (This embodiment corresponds to claim 4.)

Fig. 3 shows the actions of the amplifier control circuit. When the user depresses a key (page 13, lines 6-9) to select one of the components 2-5 as the audio input, the control circuit checks the flag for that component (Step S24 in Fig. 3) and mutes the signal (at S25) if the flag indicates that the component is not responding, due to disconnection (page 14, lines 4-11).

Claim 1 recites this subject matter

> *... (c) a control circuit of the signal processing control unit connected to a respective control circuit of each of the components the control circuit of the signal processing control unit comprising signal transmitting means for automatically transmitting at a suitable time a call signal to the control circuit of at least one of the components which is to be checked for connection or non-connection, the control circuit of each component comprising signal response means for sending an answer signal to the signal processing control unit in response to the call signal from the control circuit of the signal processing control unit;*
>
> *(d) muting means, comprised in the signal processing means, for automatically reducing substantially to zero the sound volume of the audio signal selected by the control circuit which is to be output from the signal processing circuit when the audio signal selected by the selector means is from the component not responding to the answer signal.*

The dependent claims recite additional features. Claim 2 recites that the call signal is transmitted to the control circuits of all the components when the signal processing control unit is energized, i.e., on power-up (Fig. 2 and page 11, lines 11-13). Claim 3 recites that a call signal is sent to the user-selected component (S44 in Fig. 5 and page 14, line 12 to page 15, line 18). Conversely, claim 4 recites that the call signal is sent to the control circuits of all the components in a predetermined cycle (Fig. 2, discussed above). Claim 5 recites that the signal processing circuit amplifies the signal (page 10, lines 1-2).

ISSUE

The issue is whether the Examiner erred in rejecting claims 1-4 under 35 U.S.C. §103 as being unpatentable over Matsumoto (U.S. Patent 5,621,659) in view of Heyl (U.S. Patent 5,774,567).

GROUPING OF CLAIMS

The honorable Board is requested to consider claim 1.

ARGUMENT

Matsumoto in Fig. 1A shows a control system, built into a television for interconnecting it to various electronic devices (Video Tape Recorder VTR, Multi-Disk Player MDP) that are shown in Fig. 1B, via a bus. The cables engage through connections 5a, 6a, 5b, 6b, 5c, and 6c. The devices are given codes that identify them on the bus (column 7, line 66 to column 8, line 3). Both commands and device-status inquiries are sent over the bus.

The Examiner relies on Matsumoto for disclosing the features of claim 1 except for the feature of muting the sound, admittedly not disclosed by Matsumoto (Office Action page 3, line 12).

Heyl is relied upon for disclosing the claimed muting means for automatically reducing the volume of a selected sound. But, as the Appellants discuss below, no *automatic* muting is actually disclosed in this reference.

Heyl in Fig. 3 shows level adjustment circuits 110-116. Each of the circuits 110-116 can receive a respective mute control signal (at MUTE_1, MUTE_2, MUTE_3, MUTE_4), and a respective select signal (SEL_1, etc.). The system adjusts the level of a signal which is selected, and none of the circuits will act without a select signal (col. 5, lines 29-41); the mute signal sets the output of any one of the circuits 110-116 to zero (col. 5, lines 44-52).

Heyl does not disclose the origin of either the mute signals or the select signals. The disclosure is vague, with general statements like "the level of the digital sequences ... can be independently adjusted" (col. 3, line 21),"the level ... can be independently adjusted" (col. 5, line 18), and so on, throughout the Heyl disclosure. As to muting, Heyl only states that "the level adjustment circuits 110-116 also receives ... a mute signal" (col. 4, line 26) and that muting is "based on a mute control signal" (col. 5, line 44).

Heyl discloses software as an *intermediate* source of signals to the circuits 110-116, or the circuits 216 of the Fig. 5 embodiment (which are equivalent to circuits 110-116), but not as an *ultimate* source. For example, Heyl states that "the weight [loudness] values may be set in registers or other storage areas" (col. 4, line 44), and "The control circuitry (not shown) operates to enable software to set or change the weight values for each of the sound inputs ... For example, ... the computer system could (under software control) dynamically change weight values to the registers" (col. 7, line 13).

Heyl implies ultimate control by a person, stating, "the ability to provide separate volume adjustments would be very beneficial to the user's comfort and the performance of the program involved" (see col. 8, line 66 to col. 9, line 13).

In sum, Heyl does *not* disclose "automatic" muting of any signal, as the Appellants claim. Instead, in Heyl volume levels and muting are determined by a person (even though the person's commands are actuated through software). Heyl is concerned only with a particular mechanism for adjusting loudness and/or muting, and teaches nothing about why muting should occur, or what should trigger muting.

The Errors in the Rejection: Disclosure. The Examiner asserts (line 2 in the last paragraph on page 3 of the final Office Action) that Heyl discloses "automatically inherently"

muting a signal. If the Examiner's assertion is that the disclosure of automatic muting is inherent, this it is respectfully traversed as contrary to MPEP 2143.03 ("all the claim limitations must be taught or suggested by the prior art").

At the bottom of page 3, the Examiner states that Heyl reduces sound level to zero "when the audio signal selected ... is from the component not responding to the answer signal." The Examiner appears to assert that Heyl discloses muting of the signal from a non-selected component.

Such an assertion is not correct, because Heyl states (col. 5, line 35), referring to Fig. 4, "If a decision step 302 indicates that the particular level adjustment circuit is not currently selected, then the particular level adjustment circuit simply waits until it is selected." Muting takes place *only* if the particular level adjustment circuit has already been selected: this is clear from Fig. 4 and the following text at col. 5, line 44: "Next, a decision step 306 is made based on a mute control signal."

Heyl discloses no connection between the select signals and the mute control signals.

The Errors in the Rejection: Combination. The Examiner asserts (top of page 4) that the combination of Matsumoto and Heyl "would have been obvious ... to provide a variable gain preamplifiers are no longer required for high quality sound system within personal computers" (page 4, lines 3-4).

One possible interpretation of the Examiner's assertion is that Heyl teaches that variable-gain preamplifiers are not needed with modern digital technology, and therefore it would have been obvious to add this updated technology to Matsumoto. However, Matsumoto was filed only about six months before Heyl and therefore Heyl's technology is not significantly more modern. Matsumoto does not mention or discuss amplification, and supplies no teaching toward combination on this basis. Also, "within personal computers" does not appear to apply to Matsumoto, which is concerned with interconnecting several non-computer devices.

The Appellants can think of no other possible interpretation of the Examiner's statement.

It is noted that the Examiner has pointed out no teaching in the references themselves that would have led a person of ordinary skill to combine these references, nor has the Examiner

brought forth any teaching from the general knowledge in the art. The only basis for the rejection is the Examiner's statement that variable gain preamplifiers are no longer required, which is respectfully submitted to be a motivation less than cogent.

The honorable Board is invited to further consider that Heyl is directed to digital mixing of signals, as shown by box 18 in Fig. 2 and by the adders 118-124 in Fig. 3, which "output a mixed digital signal" (col. 4, line 64). One of the output channels is sent to speakers or to headphones for the user (col. 5, lines 2-5), the other three are sent elsewhere. In contrast, Matsumoto does not mix sounds, but instead routes pure signals.

For the reasons above, the honorable Board is requested to reverse the rejection.

Respectfully submitted,

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APPENDIX: CLEAN COPY OF CLAIMS

1. (original): An audio component system comprising

(a) a plurality of components for outputting audio signals,

(b) a signal processing control unit connected to the components, the signal processing control unit comprising

a plurality of signal input terminals for receiving audio signals from the components,

selector means connected to the signal input terminals for selecting the audio signal received by a desired one of the signal input terminals,

a signal processing circuit for processing the selected signal and outputting the resulting audio signal, and

(c) a control circuit of the signal processing control unit connected to a respective control circuit of each of the components the control circuit of the signal processing control unit comprising signal transmitting means for automatically transmitting at a suitable time a call signal to the control circuit of at least one of the components which is to be checked for connection or non-connection, the control circuit of each component comprising signal response means for sending an answer signal to the signal processing control unit in response to the call signal from the control circuit of the signal processing control unit;

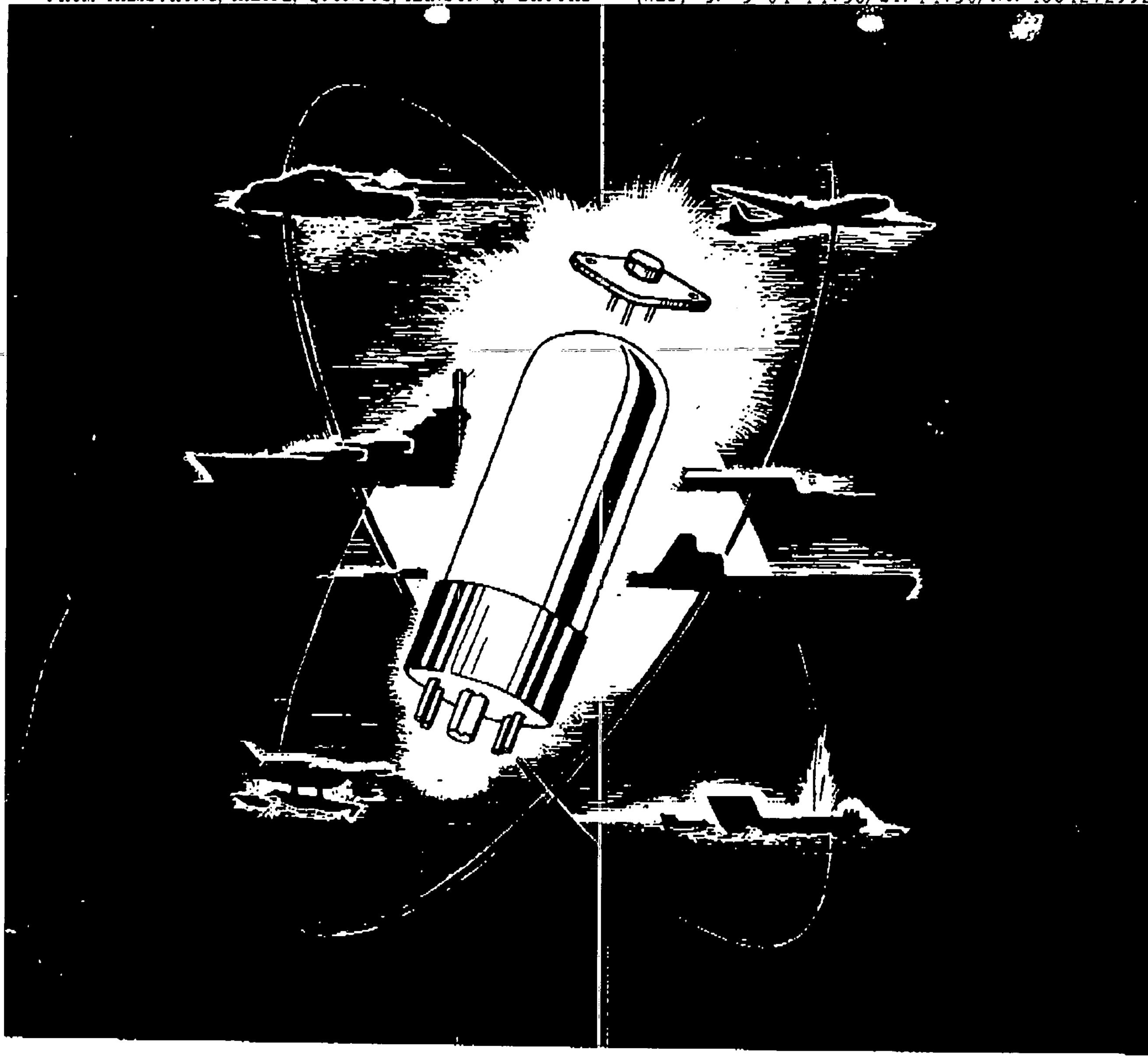
(d) muting means, comprised in the signal processing means, for automatically reducing substantially to zero the sound volume of the audio signal selected by the control circuit which is to be output from the signal processing circuit when the audio signal selected by the selector means is from the component not responding to the answer signal.

2. (original): The audio component system according to claim 1 wherein the signal transmitting means of the control circuit of the signal processing control unit transmits the call signal to the control circuits of all the components when the signal processing control unit is energized.

3. (original): The audio component system according to claim 1 wherein when one of the signal input terminals is selected by the selector means, the signal transmitting means of the control circuit of the signal processing control unit transmits the call signal to the control circuit of the component connected to the selected signal input terminal.

4. (original): The audio component system according to claim 1 wherein the signal transmitting means of the control circuit of the signal processing control unit transmits the call signal to the control circuits of all the components in a predetermined cycle.

5. (previously presented): The audio component system according to claim 1, wherein the signal processing circuit amplifies the signal.



BASIC ELECTRONICS VOL. 1

BUREAU OF NAVAL PERSONNEL

RATE TRAINING MANUAL NAVPERS 10087-C

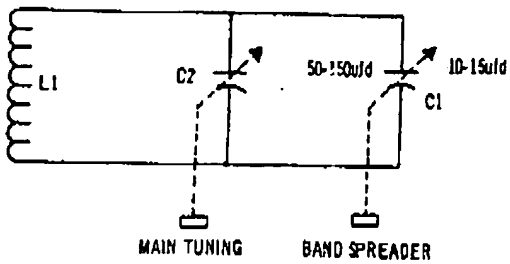


Figure 18-1.—Electrical bandspreading.

The same tuning capacitor and coil cannot be used over a wide frequency range (for example: 2 MHz to 30 MHz) because it is impractical to obtain the minimum to maximum capacitance ratio required in capacitive tuning or the minimum to maximum inductance ratio when using tuning coils. Therefore, the circuit components are changed for different frequency bands. A common method is to retain the same tuning capacitors and insert different coils on each band. An example of switching different tuned transformers is shown in figure 18-2 in which the inductance and capacitance are switched.

MANUAL GAIN CONTROL

Previously covered material indicated that high sensitivity is one of the parameters of a good receiver. In some cases high sensitivity may be a liability. For example, the signal received from a nearby station can be strong enough to overload the RF sections of the receiver. This may cause the audio output to become distorted to the point of complete loss of intelligibility. To overcome this problem, manual gain control of the RF section is utilized. By using a manual gain control, maximum sensitivity is realized and weak input signals are provided with maximum amplification, yet when a strong input signal is received, the RF gain may be reduced to prevent overloading. Typical manual gain control circuits for a receiver are illustrated in figure 18-3.

C1 is an emitter/cathode bypass capacitor. R1 and R2 develop emitter/cathode bias for the amplifier. C2 provides d.c. isolation between the tank and the base of Q1 in the transistor version. (The characteristics of transistors and variable-mu tubes have been previously discussed, and it was illustrated that amplifier gain could be varied by changing the bias.) Gain control is nothing more than a manual bias adjustn When the wiper arm of R2 is set at poi minimum forward bias is applied to the tran tor, and maximum bias is developed in the circuit. This causes both amplifiers to ope closer to cutoff and thereby reduces their When the control is moved toward point A, opposite effects occur. R1 limits the maxi conduction of the devices when R2 is short cuited. In transistor circuits, an alternate bia method may be encountered where the transi is operated near saturation. In this case, a change in gain is again a function of

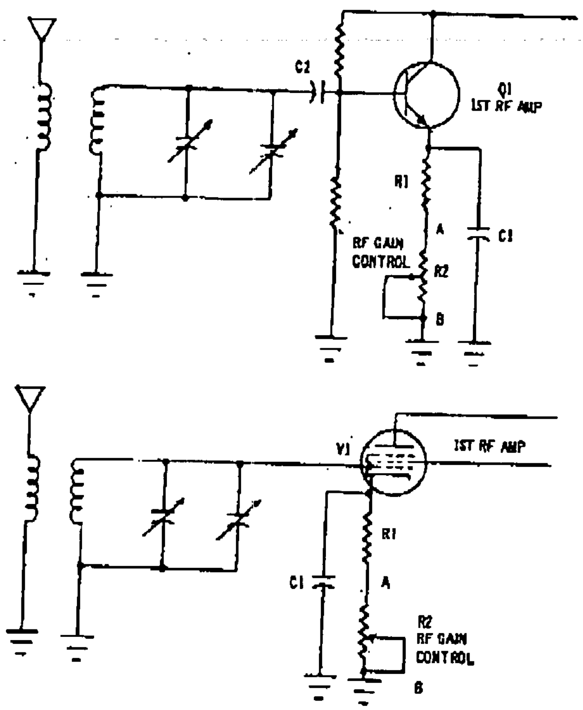
MANUAL VOLUME CONTROL

Figure 18-4 shows the schematics fo standard method of controlling volume in a su heterodyne receiver. C1 and R1 form the coupling circuit and also the means of contro the signal level applied to the audio ampli R1, R2, and R3 develop forward bias and se operating point for the transistor amplifie is the collector/plate load resistor for Q and C3 is the output coupling capacitor. By potentiometer R1 in the configuration shown input impedance of the stage remains more stant. The signal from the preceding sta felt across R1. By varying R1, the input lev Q1/V1 is varied, and the output amplitu varied.

AUTOMATIC GAIN/VOLUME CONTROI

Variations on the output volume of a rec may result from variations in the input s strength. Changes in input signal strength as a result of changing stations and from f which is caused by changing atmospheric c tions. The function of an AUTOMATIC CONTROL (AGC), also referred to as an A MATIC VOLUME CONTROL (AVC), is to unwanted variations in the output of the rec due to variations in strength of the rec signal input. In order to maintain a con output level, a receiver without AGC woul quire continuous manual readjustment to pensate for received signal changes.

Signals from stations operating at the power level may not reach the receiver an with the same power because of differenc



179.356
Figure 18-3.—Typical RF gain controls.

transmission distances, carrier frequencies, atmospheric conditions, and obstructions between the transmitter and receiver antennas.

The conclusion might be drawn that an AGC network is not necessary when the receiver is operating on a single station. However, this is not true because atmospheric conditions may cuase the signal strength to vary (fade in and out), or the antenna may receive components of the signal which have traveled along different paths. For example, one component may travel from the antenna, and another may have been reflected from a distant object. The two signals will sometimes be in phase and at other times be out of phase, thus tending to reinforce or cancel each other. The result is a variation in signal strength at the receiver antenna which is also called fading. The effect of signal strength variations in the output signal voltage of an RF stage may best be demonstrated by an example problem.

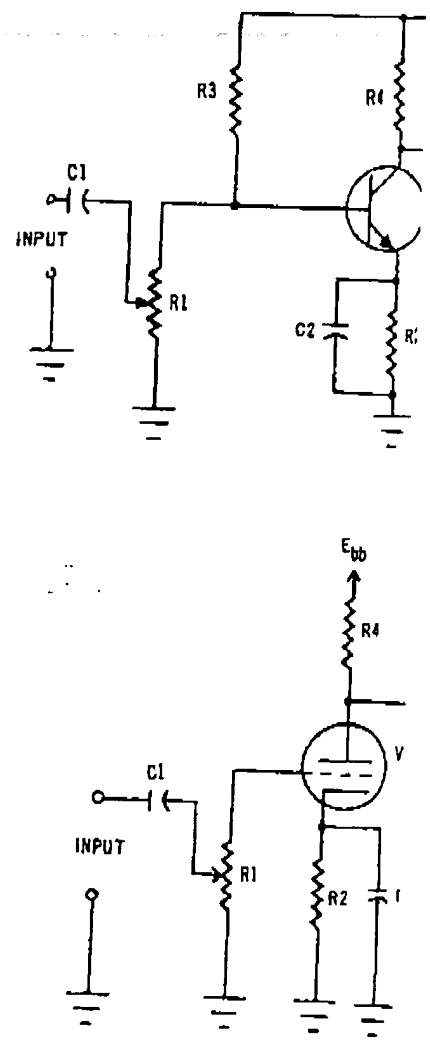


Figure 18-4.—Standard volume

Example: An RF amplifier, c receiving antenna has a voltage g the antenna receives an input signal volts, the output voltage = 100 x 1 = 1000 microvolts or 1 millivolt.

The output voltage is equal t and if fading is to be avoided the must remain at this level. However, signal is received of approxima strength (5 microvolts) of the ori